

Issue Paper

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Russia and the Information Revolution

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Russia's economic, political, and social development as well as its integration into the community of Western nations will depend importantly on the extent of its participation in the ongoing information revolution in which those nations are embarked. Under the leadership of Vladimir Putin, the Russian government has sought to promote the development of information and communications technologies (IT) in Russia, but it is both limited in the resources it can devote to this goal and concerned about the political and national security implications of IT development. At the same time, IT development and use have taken root in some segments of Russia's economy and society, but their reach and impact remain limited. Although concerns about a "digital divide" may be overwrought, it is very much an open question whether Russia has either the will or the capabilities to become a full-fledged participant in the information revolution in the foreseeable future.

This issue paper outlines some of the major trends and contradictions in the development of information and communications technologies in Russia and explores their impact on Russian society. Finally, it raises several issues for further study.

RUSSIA'S LEADERSHIP EMBRACES THE INFORMATION REVOLUTION

The Putin administration has spent a great deal of time and energy reflecting on the significance of the global information revolution for Russia's future development.

In December 1999, on the eve of his rise to the presidency, Prime Minister Putin marked the unveiling of the federal government's new Web site by publishing his vision for Russia on the Internet.¹ The following July at the G-8 summit in Okinawa, where the development and use of information technologies were major themes, President Putin surprised the other leaders (several of whom confessed computer illiteracy) by suggesting that they communicate directly via e-mail. The discussions about information and communications technologies that took place in Okinawa seemed to make a strong impression on President Putin and led him to raise the priority of IT development on his administration's action agenda. Consequently, the following months saw a considerable intensification of activity by interagency working groups, special task forces, and expert commissions.

By April 2001, enough groundwork had been completed, including the division of bureaucratic turf, that President Putin was ready to meet with a group of high-tech business executives to discuss the preparation of federal "strategic programs" to stimulate the production, diffusion, and utilization of information and communication technologies. At that meeting, Putin deplored the fact that "new technologies" account for just 0.6 percent of Russian GDP. "Unfortunately," he concluded, "the level of devel-

¹The government's Web site can be found at <http://www.government.ru>.

opment of the New Economy does not yet correspond with its importance for the country."² Similarly, a sharp warning was issued by the Kremlin's chief economist, Andrei Illarionov, who said that Russia's economic recovery could not be sustained unless something drastic was done to overcome the country's "abject failure to find markets for its high-tech sector."³ At the same time, Putin announced the formation of a high-level group chaired by Vladimir Fortov, vice chairman of the Russian Academy of Sciences, to advise the president on how best to "promote the development of information technologies and ensure the diffusion of new ideas throughout the economy." Shortly thereafter, a draft "master program"—the declared purpose of which was to foster an "Electronic Russia"—was made available on-line for public comment and discussion. This "E-Russia" program, which received formal approval in January 2002, calls for rapid acceleration in the use of information technology in government, business, and society.⁴

One priority identified in E-Russia is infrastructure development. Proposals have been made for the federal and regional governments to help fund the construction of a high-speed Internet "backbone" and peripheral links and to promote access through, for example, subsidized service to universities and research and development institutions. The Ministry of Telecommunications has also announced a ten-year plan to spend \$30 billion—half of which would come from nongovernmental sources—to upgrade the nation's telecommunications infrastructure, with a high priority on Internet development. Similarly, the Railways Ministry has announced plans to invest millions of dollars to expand Transtelecom, a subsidiary that provides communications services for the railways, into a commercial nationwide voice and data carrier.⁵

IT policymakers and advocates have also identified policy measures to promote IT research and development. The E-Russia initiative calls for the federal government to ease licensing restrictions on the import and export of high-tech equipment and software, to enforce intellectual property rights protections, to facilitate technology transfer from public institutions to private firms, and to pro-

mote IT acquisition by government agencies and organizations. Numerous efforts are under way to organize IT "incubators" and "technoparks" around major universities and in communities with large concentrations of highly trained programmers, mathematicians, and engineers—such as St. Petersburg, Zelenograd, and the *akademgorodki* [academic quarters] of Novosibirsk and Krasnoyarsk. The federal government has recommended that the facilities and equipment for such incubators be procured from state-owned enterprises undergoing restructuring or liquidation.⁶

Information and communications technologies are also seen as tools for improving governmental performance and transparency in decisionmaking. Along these lines, President Putin has said that public officials should be computer literate.⁷ At his April 2001 meeting with IT executives, Putin expressed the intent that all federal agencies would, by the end of the year, post their business on the Internet and update their Web sites on a daily basis. By October 2001, the federal government was to begin conducting tenders for goods and services on-line, with the goal of opening up the procurement process to promote competition and reduce corruption. The E-Russia program calls for the creation of a government-wide Intranet, the integration of agency databases, and the real-time drafting and discussion of federal legislation and regulations on-line.

Finally, policymakers see IT being used widely by Russian society. The Putin administration has established a federal program with the goal of having computers and Internet access available in all higher educational institutions by 2005 and in all secondary schools by 2010. The E-Russia program envisions that 25 million Russians will be on-line by 2010. Perhaps most interesting given Russia's history, it asserts that widespread IT diffusion is "a prerequisite for the development of civil society based on free access to information through the global Internet."

In short, Russia's policymakers see IT as spurring economic change and development, boosting Russia's inter-

²"Putin Sets Hi-Tech Priorities," Interfax, April 13, 2001.

³Giles Whittell, "Russia's Mother of All Inventions," *The Times* (London), February 3, 2001.

⁴Russian Federation Ministry of Economic Development and Trade, *Federal'naya Tselevaya Programma "Elektronnaya Rossiya" na 2002–2010 gody*, Moscow, April 2001 (<http://www.economy.gov.ru/erus.html>).

⁵Angela Hall, "Russia's Railway Ministry Invests in Telecoms Network," *Europemedia.net*, August 5, 2001.

⁶Limited efforts are under way: With funding from the U.S. Department of Energy's Nuclear Cities Initiative, an Open Computing Center was established in 1999 to provide commercial employment for IT specialists in the closed "nuclear city" of Sarov (formerly Arzamas-16).

⁷For a transcript of the session at which this remark was made, see *Internet-Konferentsiya Prezidenta Rossiiskoi Federatsii V. V. Putina*, Moscow, March 6, 2001 (<http://president.kremlin.ru/events/178.html>). In the March 2001 forum, Putin also admitted that his official Web site did not meet his quality standard.

national competitiveness, improving the productivity and responsiveness of government, and creating a more educated, informed, and engaged citizenry.

A LONG WAY TO GO TO "E-RUSSIA"

While Russia's leadership has identified the potential benefits of information technologies and participation in the information revolution, a great distance must be covered to overcome the impediments to reaching the goal of an "E-Russia."

Most fundamentally, in the areas of IT development, diffusion, and application, Russia still remains far behind those nations with which Russian elites like to compare their country:

- In 2000, Russia had 22 telephone lines per 100 inhabitants, compared with 61 in Germany and 70 in the United States (see Table 1). Russia's 5 percent rate of growth in international telephone traffic (measured as outgoing calls) between 1995 and 1998 lagged far behind the 9.5 percent average growth registered worldwide.

Table 1

Basic Indicators of Information Technology Development, 2000

Country	Main Telephone Lines per 100 Inhabitants	Estimated PCs per 100 Inhabitants	Internet Hosts per 1,000 Inhabitants	Internet Users per 100 Inhabitants
Russia	21.83	4.29	2.22	2.11
Germany	61.05	33.60	24.81	29.18
Italy	47.39	17.98	17.80	23.04
Poland	28.24	6.89	8.77	7.22
Malaysia	19.92	10.31	2.93	15.90
Republic of Korea	46.37	23.79	8.41	40.25
China	11.18	1.59	0.01	1.74
Mexico	12.47	5.06	5.66	2.74
Brazil	18.18	4.41	5.15	2.94
United States	69.97	58.52	29.28	34.66

SOURCE: International Telecommunication Union, January 2002.
<http://www.itu.int/ITU-D/ict/statistics/>.

- The stock of personal computers in Russia in 2000 was lower than that in Brazil and Mexico. Three-quarters of Russians polled in a January 2001 survey had never even used a PC.
- Development of the Russian portion of the Internet (dubbed "Runet") lags behind that of the West and many major developing nations, such as Malaysia.

- According to a June 2001 State Council report, Russia's schools have just one computer for every 500 students, and just one in 50 schools has Internet access. For comparison, almost all elementary and secondary schools in the United States had Internet access by 2001.
- Russia also does not have any major firms or facilities engaged in the production of such IT hardware as PCs. In a RAND survey of trends in the global information revolution, Russia was not even identified as a visible actor in technology development or application.⁸
- In 2001, the Economist Intelligence Unit ranked Russia 42nd of 60 countries evaluated for e-business readiness—behind Peru and Egypt (see Table 2).

Table 2

Russia's Ranking in Selected Business Surveys

Study	Russia's Rank
World Economic Forum Growth Competitiveness Ranking (2001)	63/73
Transparency International Corruption Perceptions Index (2001)	79/91
Milken Institute Capital Access Index (2000)	80/81
Economist Intelligence Unit Business Environment Ranking (1997–2001)	55/60
Economist Intelligence Unit E-Business Readiness Ranking (2001)	42/60

Russia's long-term IT innovation capabilities are also open to question. In 1990, 1.6 million people were reported to be employed in the science sector. Ten years later, that number had fallen by one-half. Since the mid-1980s, basic research in Russia has been hobbled by a lack of steady funding. In an August 2000 speech to the Russian Academy of Sciences, President Putin reported that 30,000 Russian scientists had moved to work abroad. After the United States and Germany sharply increased the number of long-term work visas available to information technology specialists in 2000, Communications Minister Leonid Reyman warned that Russia faced a wave of "computer brain drain."⁹

⁸Richard O. Hundley, Robert H. Anderson, Tora K. Bikson, James A. Dewar, Jerrold Green, Martin Libicki, and C. Richard Neu, *The Global Course of the Information Revolution: Political, Economic, and Social Consequences*, Santa Monica, CA: RAND, CF-154-NIC, 2000 (<http://www.rand.org/publications/CF/CF154/>).

⁹"Russian Universities Educate World's Top Student Programmers," *Chronicle of Higher Education*, October 20, 2000, p. A43.

Such indicators suggest that Russia risks being caught on the wrong side of the global digital divide. The leader of the RAND survey mentioned above concluded: "It's not just a question of Russia catching up with other nations that are advanced today insofar as the information revolution is concerned; it's also a question of Russia catching up with nations that are also moving ahead faster—often much faster—than is Russia."¹⁰ The chief executive of one of Russia's largest oil companies noted that Russia's window of opportunity for jumping on the IT bandwagon was closing fast. "The rest of the world is moving on," he said.¹¹

SOMETHING TO WORK WITH

Despite these shortfalls, Russia does have basic resources available to move the economy, government, and society toward the vision of an E-Russia, and it has already made notable progress on these fronts—especially when we consider where the country was in Soviet times.

A little over a decade ago, business and government (outside of national security agencies) could not rely on information technologies. The telecommunications industry was a government monopoly and its poor service was legendary. Intercity (and often local) messages were sent by telegram. The abacus was used for accounting. The few Soviet computers that were in use at that time were mainframe systems, considered obsolescent by international standards.¹²

Today, faxes, mobile phones, and personal computers are common. These, together with computer networks, are improving the efficiency of the economy by enhancing the level of detail of information available as well as its geographic reach—critical improvements in thin, dispersed markets.¹³ Among the first commercial users of the Internet in Russia, in the early 1990s, were wholesalers who used e-mail to post their prices for everything from computers to catsup. Now, business information and retail and wholesale markets are moving onto the Web at sites such as Interfax, Rambler, and Allshops.

¹⁰Richard O. Hundley, Associate Director, National Defense Research Institute, Applied Science and Technology Program, RAND, personal communication, July 2001.

¹¹Personal communication, New York City, May 2000.

¹²A push by the Soviet government in the late 1980s to quickly develop a desktop computer industry based on cloning Western technologies failed. See Igor Agamirzian, "Russia on the World IT Services Market: Current Situation and Perspectives," presentation at Software Outsourcing Summit 2001, St. Petersburg, June 2001 (<http://www.soft-outsourcing.com/english/archive.asp>).

¹³Severin Borenstein and Garth Saloner, "Economics and Electronic Commerce," *Journal of Economic Perspectives*, Winter 2001.

A number of Russian "Old Economy" firms have invested in IT to improve financial controls and supply chain management and to oversee their rapidly growing business empires. An executive at one of Russia's largest oil companies noted that his firm was investing in IT to "centralize" accounting and inventory management and to put these operations under the control of top-level executives. Better accounting tools are critical to firm restructuring in a country where intra-enterprise corruption and worker theft are widespread phenomena.¹⁴

IT is helping Russian entrepreneurs and firms overcome their country's historic isolation from international markets. Today, financial analysts and traders in Moscow monitor international markets in real time and watch for the latest developments at the U.S. Treasury and the Federal Reserve. As manufacturing and retail enterprises around the world develop global supply chains and move their purchasing to e-commerce platforms, firms in Russia are using the Internet to compete directly with their Western counterparts. To this end, a British-Russian consortium in 2000 opened Europe-Steel.com, a trading exchange to promote Russian metals sales on international markets. Other exchanges have been developed for mining, oil, and drilling services.

Information and communications technologies have also been used to improve public-sector performance. For instance, to bring Russia's antiquated banking sector into the modern era, the Russian Central Bank has invested heavily in IT, including proprietary communications satellites, allowing it to quickly implement an electronic payments clearing system across half of the country's 79 banking regions, thus eliminating the use of paper checks for payrolls and other tasks.¹⁵ Auctions of the assets of failed commercial banks by the Agency for Reconstruction of Credit Organization are conducted on-line.

A small but dynamic New Economy sector based on the integration of Western technologies emerged in the 1990s to meet the demand for information and communications technologies and services. International Business Systems was founded in 1992 and has grown to be Russia's largest IT integration, retailing, and e-commerce

¹⁴Personal communication, Moscow, November 2000. Another Russian executive reported that after his firm acquired a major automobile engine manufacturer in early 2001, an audit revealed that 6–10 percent of the plant's inventory was lost to theft (personal communication, New York City, June 2001).

¹⁵Maria Trombly, "Tech Revolutionizes Russia's Central Bank," *Computerworld*, April 23, 2001.

firm, earning over \$193 million in sales in 1999 and employing a staff of 1,500. At the end of 2000, Russia counted some 400 Internet service providers. Relcom (Reliable Communications), one of Russia's largest Internet providers, emerged in the early 1990s from Moscow's Kurchatov Institute of Atomic Energy. Independent installers helped boost the number of main telephone lines by 30 percent—from 23.4 million in 1990 to 31.8 million in 2000. At the same time, several wireless firms emerged to develop mobile phone networks in most major Russian cities. By the end of 2000, there were over 2.8 million subscribers, and that number was doubling every year.

As Russian specialists have become adept at integrating Western technologies, they have proven themselves skilled innovators and developers in their own right—especially in the field of software development. Thanks to the end of Cold War competition and cuts in government funding of science and technology, Russia possesses a sizable number of underemployed high-tech specialists including experienced software designers and programmers with a broad and deep knowledge of mathematics and engineering.¹⁶ Russian institutions of higher education and advanced training, despite cutbacks in public funding, still produce almost 100,000 programmers every year. In addition, Russia's education system is particularly well set up to identify and promote the most talented students in such fields as math and physics.¹⁷ Judging by the winning performances of students in international competitions over the past several years, these schools have retained their world-class caliber.¹⁸ Such talent can cost one-fifth of what such labor costs in the United States, even considering the added expense of managing an offshore operation.¹⁹

Contrary to Russia's gangster image, Russia's New Economy ventures are run by talented, forward-thinking entrepreneurs intent on building serious, world-class businesses. Esther Dyson, a U.S.-based IT investor and industry leader, argues that because Russia's IT capabilities and firms are being built from scratch and are oriented toward

Western technologies, its New Economy enjoys a culture that is refreshing in its transparency, spirit of competition, and cohesion.²⁰ Not surprisingly, in a 1999 survey of the Russian economy, the McKinsey Global Institute found that Russia's software development industry had the highest productivity of ten sectors examined and was thus its most internationally competitive industry.²¹

The sector's international orientation and price competitiveness is reflected in a number of successful offshore software development ventures. An illustrative case is the Boeing Company, which has hired over 200 programmers in Russia through partnerships with Illyushin, Tupolev, and International Business Systems. An Intel Development Lab was opened in Nizhnii Novgorod in 2000, and the company plans to expand into St. Petersburg. Such investments indicate that the firm is "very serious about developing long term business in Russia."²² For over ten years, Sun Microsystems has contracted systems software and customized implementation work to a team of 250 engineers working in Moscow, Novosibirsk, and other locations. Jason Horowitz, the Russian project team manager, notes that Russian programmers are "very serious engineers" and, in comparison with their counterparts in other countries, they tend to be "stronger at tasks that require a deeper mathematical background." Sun has teams around the world working on similar projects—in countries such as Ireland, India, Israel, and the Czech Republic—but programmers in such countries typically "don't have anywhere near the talent as the Russians." For this, they have gained the esteem of Sun's engineers at the company's headquarters in Silicon Valley.²³

In 2000, Russia's offshore programming revenues were estimated at \$60–100 million and were estimated to be growing 40–60 percent annually. An estimated 5,000–8,000 programmers were employed in the industry,²⁴ but, because such ventures do not follow traditional patterns of foreign investment and business development, they are

¹⁶In the late 1990s, Russia ranked third in the world in the number of workers in science per total population—behind only Japan and the United States.

¹⁷Kamil Isaev, Academic and Government Programs Manager, Intel Technologies, Inc., Moscow, personal communication, November 2001.

¹⁸In both 2000 and 2001, teams from St. Petersburg State University won the International Collegiate Programming Contest World Finals sponsored by IBM (<http://icpc.baylor.edu/icpc/>).

¹⁹Jason Horowitz, Manager, Russia Program Office, Sun Microsystems, Inc., personal communication, June 2001.

²⁰Esther Dyson, President, EDVenture Holdings, personal communication, October 2000.

²¹McKinsey Global Institute, *Unlocking Economic Growth in Russia*, Moscow, 1999 (<http://mgi.mckinsey.com/mgi/russian.asp>). The sectors examined were steel, cement, oil, dairy, confectionery, residential construction, food and merchandise retailing, hotels, and software.

²²Jim Jarrett, Vice President, Government Relations Worldwide, Intel Corporation, conference presentation, San Francisco, March 2001 (<http://www.bisnis.doc.gov/russianconf.htm>).

²³Horowitz, personal communication, April 2001.

²⁴Information Technologies and Telecommunications Committee, American Chamber of Commerce in Russia, *Whitepaper on Offshore Software Development in Russia*, Moscow, March 2001 (http://www.amcham.ru/wp/off_soft_wp.htm) (accessed November 2001).

less visible and not well studied. Nevertheless, they represent promising solutions for overcoming Russia's inhospitable business climate.

PROSPECTS FOR AN E-RUSSIA

Even given the progress that is under way, none of the goals proclaimed for the creation of an E-Russia will be easily or quickly accomplished. Many of the policies that are being advocated or adopted are unlikely to achieve their goals or could even be counterproductive.

The E-Russia program calls for federal spending of \$1.3 billion, to be matched by another \$750 million from regional governments. Will the resources be available? The federal government has an established history of not funding its numerous "Presidential Priority Programs" in science and technology, so they accomplish little in reality.²⁵ In July 2001, the Ministry of Education already had threatened 12 regions that the federal government would not provide computers for public schools if the regions did not cover their half of the program's cost.²⁶ In any case, an ambitious program may not be warranted: Experiments with e-government in Europe and North America suggest that demonstrating successes with smaller initiatives in specific programs or agencies having the appropriate entrepreneurial climate may be the best way to start out.²⁷

Second, it is not clear that focusing on IT should be a priority at this time for Russian government or industry. After decades of massive IT investment in the West, the United States appears to be the only country to have registered measurable productivity benefits from the information revolution—and these finally started to appear only in the late 1990s.²⁸ In a discussion of IT trends in Russian business, a Russian executive commented that Russian firms do not have a strong incentive to invest in IT: He, for example, was achieving enormous productivity increases

at his heavy industrial operations just by firing excess workers, and he had a long way still to go before he would need computers to replace laid-off workers.²⁹ According to Yukos Chief Executive Officer Mikhail Khodorkovsky, information technologies were expected to save his oil company just \$30 million over three years while gross revenues would be over \$7 billion.³⁰ In short, improving the performance of business and government need not depend on making significant investments in IT capabilities at this time.

Third, as business and government in the United States and elsewhere have learned over the past 25 years, spending on IT hardware must be matched with appropriate investments in "knowledge management" and other organizational transformations (i.e., investment in people) to ensure that the large volume of information that is being generated is actually used.³¹ Efforts by the Soviet government in the late 1980s to develop a unified database to improve central planning and management of the economy failed in part because the government agencies involved refused to share information.³² In Russia today, many business managers continue to believe that controlling business information is "a major tool of power," observed a portfolio manager, adding that despite investments in IT, "artificial constraints on information flows" are still an issue of concern.³³ Similarly, e-commerce may not go very far in Russia because the generation of electronic records of business transactions is inimical to tax evasion.³⁴ Speaking more broadly about Russia's IT chal-

²⁵Given their typically ambitious goals, two-thirds of the objectives of Federal Priority Programs never get implemented, observed a drafter of the E-Russia initiative.

²⁶*Izvestiya*, July 26, 2001, cited by RFE/RL *Newsline*, July 27, 2001.

²⁷"Government and the Internet," *The Economist*, June 24, 2000. An IBM executive notes therein: "About 85 percent of public sector IT projects are deemed to be failures."

²⁸See, for instance, Stephen D. Oliner and Daniel E. Sichel, "The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?" Federal Reserve Board Finance and Economics Discussion Series No. 20, 2000; and Martin Baily and Robert Lawrence, *Do We Have a New E-Economy?* NBER Working Paper 8243, April 2001.

²⁹Personal communication, Moscow, November 2000. The aforementioned McKinsey report, *Unlocking Economic Growth in Russia*, corroborates this argument. It points out that Russian firms in many sectors can achieve significant gains in productivity and become internationally competitive through better management, thus avoiding the need, at least in the intermediate term, for extensive retooling.

³⁰Khordorkovsky added: "The Internet doesn't affect oil commerce because the biggest feature is transportation costs. Communications based on the Internet won't significantly affect the economy of Old Economy companies. It's significant for companies with less than \$100 million a year in sales and companies with large distribution networks. The number of companies in that category in Russia is quite small" ("Yukos' Khodorkovsky on Internet, Electronic Commerce," Bloomberg, October 26, 2000).

³¹Erik Brynjolfsson and Lorin M. Hitt, "Beyond Computerization: Information Technology, Organizational Transformation, and Business Performance," *Journal of Economic Perspectives*, Fall 2000 (<http://ebusiness.mit.edu/erik/>).

³²Agamirzian, "Russia on the World IT Services Market."

³³Vladimir Andrienko, Managing Director, Russia Partners LLC, personal communication, Moscow, October 2001.

³⁴American business leader, personal communication, Moscow, November 2000.

lenge, an American business leader in the media and information sector argued that IT alone does not promote openness in society or stronger ties between its individuals in the society. Rather, the key issue is to what ends people choose to use these technologies.³⁵ In sum, for Russia to realize many of the benefits of the information revolution will require decentralizing government and business institutions and encouraging the free flow of information—dramatic changes for a culture that has equated power with control over information.

Fourth, there is no proven policy recipe to promote technology development. Efforts around the world to create technology clusters that mimic Silicon Valley have had mixed results. Moreover, government efforts to pick “winning” technologies as part of an official industrial policy typically do not result in the most productive use of government resources. In Russia, the government has sponsored numerous strategic research programs, but the priority-setting process typically has not been guided by merit. Such efforts as creating tax-free zones or technoparks, Sun Microsystems’ Horowitz notes, “in the Russian context become goals in themselves.”³⁶ These endeavors are especially problematic in the IT sector, given the rapid pace of technological change. Government funds may be more effectively spent to improve Russia’s telecommunications infrastructure, thus ensuring that more people and businesses have reliable access. Horowitz suggests a policy of “benign neglect.”

Fifth, one may ask: Does Russia have a sufficient comparative advantage to enable it to become a major IT innovator and developer? Russia’s IT research, development, and export aspirations place it in competition with many other countries—India, Ireland, and Israel are the main competitors in the global outsourcing market—that have already been investing billions in their efforts to jump on the IT “development train.” A foreign investor with a broad international experience in technology development argues that Russian firms trying by themselves to break into the international software markets are handicapped

because they are too small, do not have a good understanding of the notion of value creation, and lack sufficient business-building capacity.³⁷ Speaking of Russia’s need to boost its IT profile, Dmitry Loschinin, managing director of Luxoft, a leading Russian IT outsourcer, observed, “We thought all we had to do was be good and people would recognize us.”³⁸ Although the Putin administration has targeted IT as an export sector for growth, Russia’s large trade surpluses, created by massive exports of energy, minerals, and other commodities (another administration priority), have bolstered the exchange rate of the ruble. A strong ruble makes IT imports relatively cheaper and Russian IT exports less competitive internationally.³⁹

Finally, the pace at which Russia moves forward in the years to come—both in the integration of IT and as an IT innovator and developer—will be decisively determined by the direction and rate of change in the overall economy and its business climate. As with the development of the Russian economy in general, IT integration and innovation are hampered by bureaucratic red tape, the absence of credit and equity markets, poor protection of property rights, official corruption, and burdensome taxes.⁴⁰ Unlike Russia’s Old Economy oligarchs, the country’s New Economy entrepreneurs lack political clout and are especially vulnerable to the bureaucratic and structural impediments to business development in Russia.⁴¹

³⁷Dr. Jan Dauman, Director, Central European Trust, personal communication, Moscow, February 2002. Dauman argues that instead of the current “entrepreneurial model,” Russian software talent is more likely to realize its value by joining large multinational organizations.

³⁸Esther Dyson, “Russia Rolls Out Thriving Program Skill,” *South China Morning Post*, May 1, 2001.

³⁹Currency appreciation is one symptom of the so-called Dutch Disease—a result of fiscal imbalances experienced by many countries heavily dependent on windfall earnings, usually from energy exports. A reliance on commodity exports can also undermine or thwart the development of a country’s industrial and services sectors and exports. See, for example, Alan Gelb, *Oil Windfalls: Blessing or Curse?* (New York: Oxford University Press, 1988); and Jeffrey D. Sachs and Andrew M. Warner, “Natural Resource Abundance and Economic Growth,” Harvard Institute for International Development Discussion Paper, October 1995 (<http://www.hiidd.harvard.edu/pub/pdfs/517.pdf>).

⁴⁰In his April 2001 address to the Russian Parliament, President Putin stated: “The legislative foundation of the management of industrial science is extremely clumsy, complicated, and confused. The system of protection, defense, and use of the rights of intellectual property is also inadequate” (<http://www.strana.ru/986299751.html>).

⁴¹According to the “virtual economy” thesis, efforts by bankrupt Old Economy firms to stay afloat through the use of barter and the non-payment of taxes and debts impose a de facto tax on entrepreneurial activity (Clifford G. Gaddy and Barry W. Ickes, “Russia’s Virtual Economy,” *Foreign Affairs*, September/October 1998, p. 53).

³⁵Personal communication, Moscow, November 2000. Programs in Europe to promote Internet access and use have foundered on this same issue: “Where we made a mistake was the concentration on the technology side,” said Erkki Liikanen, the European Union commissioner responsible for Internet policy. “People thought that with the technology available, the users would just follow” (Daniel Dombey, “EU’s Internet Revolution Loses Momentum,” *Financial Times*, February 22, 2002).

³⁶Jason Horowitz, personal communication, June 2001.

On these points, Russia's repeatedly ranks at or near the bottom of the charts for business environment (see Table 2 on page 3). An undue preoccupation with IT development programs and complex e-commerce, encryption, and antipiracy legislation would only distract Russian decisionmakers from more fundamental policy needs, such as ensuring that existing laws governing contracts and property rights are enforced in a consistent and transparent manner. In short, to develop a dynamic and internationally competitive IT sector, Russia first needs to develop a dynamic and internationally competitive economy.

To summarize, concerns about Russia being trapped behind the digital divide may be overwrought. As we have already seen in the 1990s, Russia need not be an IT innovator to become a large-scale acquirer, adept user, and beneficiary of the latest information and communication technologies from abroad. Policies to promote IT deployment, use, and development in Russia can provide additional payoffs, especially if they are made in tandem with other necessary reforms. But IT is not, for the immediate future, a critical force that, by itself, will radically improve the performance of government, business, or the economy in Russia.

THE RISE OF AN INFORMATION SOCIETY

Given the enormous uncertainties about these variables, there is no point in hazarding a guess about how much closer to reality E-Russia will come or what its impact will be on business or government performance. All that can be said with any confidence is that the present momentum in IT development is probably sufficient to keep the Russian economy moving ahead for some time to come: An acceleration of Russia's current economic recovery could propel its IT development well beyond where it is today, and the more electronically "connected" Russia becomes, the more it will be able to rely on IT to stimulate further economic growth and social change.

In any case, Russia's more active participation in the information revolution seems certain to ensure that more Russians will be getting on the "information superhighway" in the coming years. Indeed, in 2001 alone, the number of regular Internet users shot up 39 percent to 4.3 million people, according to the Communications Ministry.⁴² Internet cafés have opened all over Russia. TimeOnline, a café located in Moscow's Manezh shopping center, is

packed with hundreds of young Russians surfing the Web and sending e-mail 24 hours a day. The Runet has become a vibrant market for information and ideas—of all orientations.⁴³ The Runet offers Russian citizens access to a range of independent and reputable domestic news and information sites—such as Lenta.ru, Gazeta.ru, and Internews.ru—and survey data suggest that information sites are a high priority of Web surfers.⁴⁴ By mid-2001, 180 parties and other political movements had established Web sites. Efforts are under way to provide on-line access to the Russian State Library in Moscow—one of the largest collections in the world.⁴⁵ As Internet penetration increases, more and more Russians are gaining access to a plethora of international media and information sites, such as MSNBC, CNN, and Yahoo. Andrey Bogdanov, a market analyst at Alfa Bank noted, "People in Russia are highly educated and want to get on-line and be a part of the worldwide flow of information."⁴⁶

Not surprisingly, increased use of e-mail and access to the Internet is facilitating Russian citizens' exposure to "politically incorrect" messages, such as opposition to Moscow's campaign to subdue Chechnya.⁴⁷ Furthermore, growing use of e-mail and the Internet is enabling those citizens with unorthodox and heterodox opinions (those who would have been identified, admired, and persecuted as *inakomyslyashchiye* [those who think differently] in the Soviet Union) to network and form not only "virtual" but actual organizations through which to pursue their interests more effectively. Since the late 1980s, citizens and civic groups across Russia working on a range of issues—human rights, reform of the military, women's and children's welfare, democratization—have made great strides in organization through their savvy use of e-mail and the Internet.⁴⁸ Environmentalists have been in the forefront of

⁴³In addition to the Runet, Russia has witnessed the vigorous development of Fidonet—an alternative low-cost, grassroots network. See Rafal Rohozinski, "Mapping Russian Cyberspace: Perspectives on Democracy and the Net," UNRISD Conference on Information Technologies and Social Development, Geneva, June 1998 (<http://www.unrisd.org/infotech/conferen/papers.htm>).

⁴⁴According to the Rambler Web survey (<http://top100.rambler.ru>), media sites regularly are among the most visited on the Runet.

⁴⁵See <http://www.rsl.ru/tacis/homeru.htm>.

⁴⁶John Varoli, "Russia Tries to Catch Up," *New York Times*, July 16, 2001, p. C5.

⁴⁷See, for example, the main Chechen Web site (<http://www.kavkaz.org>) as well as the many Web sites devoted to Chechen affairs and the military campaign (<http://www.olestig.dk/tjetjenien/links.eng.html>).

⁴⁸For more on the use of information technologies by grassroots activists and civic groups across Eurasia, see ISAR: The Institute for Social Action and Renewal in Eurasia, *Give & Take*, Fall/Winter 1999/2000 (<http://www.isar.org/isar/archive/GT/GT.html>).

⁴²"Net Use Leaps 39% in 2001, With More Growth Expected," *Moscow Times*, February 6, 2002.

this trend. For instance, activists in Moscow, the Urals, and Siberia have used e-mail to oppose efforts by the Ministry of Atomic Energy to import, store, and reprocess nuclear waste and to campaign against the Putin administration's decision in May 2000 to disband the federal environmental protection agency. By using IT to engage activists in the West (where businesses usually are more sensitive to media attention and public pressure) about the activities of international energy and minerals firms developing resources in the Russian Far East, local grassroots environmentalists have been able to overcome their geographic isolation and small numbers to effect real changes in corporate and government policies.

THE POLITICAL CHALLENGE

As one would expect in an administration in which former and current secret police and intelligence officers occupy key positions, a major preoccupation has been defense against the risks that uncontrolled information flows could pose to Russia's political stability and national security. As a result of this preoccupation, President Putin has authorized a variety of steps to enhance the government's ability to monitor electronic communications and ensure that, in Putin's words, the latter are used "with particular responsibility."⁴⁹ Shortly after he was appointed acting president, Putin approved a secret rule permitting the tax police, the Interior Ministry, and the Kremlin and parliamentary security services to intercept such electronic communications as data and e-mail.⁵⁰ In July 2000, the government promulgated additional regulations making information about the eavesdropping equipment a state secret and enabling government agencies to monitor communications for up to two days before getting court approval as required by the Russian Constitution.⁵¹ While Internet service providers do not like these rules, all but one have played along to avoid antagonizing officials.⁵²

Explaining the enthusiasm for E-Russia, one Russian IT manager observed, darkly, that most bureaucrats in Russia view IT as a tool to obtain more information about the population, rather than to get more information to the population.⁵³

In addition and perhaps more significantly, President Putin in September 2000 signed off on the final version of a national Information Security Doctrine.⁵⁴ Among other points, the Doctrine deplores "the increased dependence of the spiritual, economic, and political spheres of Russia's social life on overseas information entities," and goes on to warn against foreign penetration of Russia's "scientific-technical space" and subversive efforts of Western governments "to reorient the scientific and technical ties" between Russia and other members of the Commonwealth of Independent States toward the West.⁵⁵ In January 2002, the president signed legislation on digital signatures that promises to give another national security organ, the Federal Service for Government Communications and Information (FAPSI), control over on-line transactions.

The impact of all these control efforts is unclear. The Interior Ministry probably lacks sufficient personnel and technical proficiency to monitor e-mail traffic effectively. Moreover, the one Internet service provider that defied the order won its case in court.⁵⁶ The digital signature legislation can be seen as an effort by FAPSI to generate revenue and employment for its specialists, rather than as a tool to monitor or regulate e-commerce.⁵⁷ And President Putin in July 2001 appeared to distance himself from the Information Security Doctrine, telling journalists: "I will not criticize my colleagues right now, but several items and formulations could probably have appeared differently."⁵⁸ Although concerns about a political crackdown may be premature, such ill-conceived bureaucratic moves are

⁴⁹Presidential communication to International Information Congress, Moscow, June 25, 2001, cited by RFE/RL *Security Watch*, July 2, 2001.

⁵⁰The Putin initiative extended a regulation (System of Operative and Investigative Procedures, or SORM) that was adopted in 1998 by the Yeltsin administration, which requires Internet service providers to install, at their own expense, equipment enabling the Federal Security Service to monitor electronic communications. Earlier regulations had applied such measures to voice communications.

⁵¹In response to a suit brought by a Russian journalist, the Supreme Court in September 2000 struck down the government's attempts to monitor e-mail for up to two days without court approval.

⁵²Sharon LaFraniere, "Russian Spies, They've Got Mail: Regulations Allow Security Services to Tap into Systems of Internet Providers," *Washington Post*, March 7, 2002, p. A14.

⁵³Personal communication, Moscow, November 2001.

⁵⁴The Doctrine had been in the works since 1994. However, according to the accounts of Vladimir Rubanov, the deputy chairman of the Security Council until 1996, what emerged in 2000 appears to be vastly different than the early drafts (Interview with Rubanov, NTV, October 23, 2000).

⁵⁵Russian Federation Security Council, *Doktrina informatsionnoi bezopasnosti Rossiiskoi Federatsii*, Moscow, September 2000 (<http://www.scrf.gov.ru/Documents/Decree/2000/09-09.html>).

⁵⁶Sharon LaFraniere, "Russian Spies, They've Got Mail."

⁵⁷Russian IT policy specialist, personal communication, Moscow, February 2002.

⁵⁸Press-Konferentsiya Prezidenta Rossiiskoi Federatsii V. V. Putina, Moscow, July 18, 2001 (<http://president.kremlin.ru/events/264.html>).

sure to make IT development and the expansion of access to the Internet more arduous and costly.

Whatever its pace, Russia's more active participation in the information revolution seems certain to exacerbate the tension between the Putin administration's vision of an electronic Russia (with its goal of 25 million Russians on-line by 2010) and the Information Security Doctrine (where Russia's "information space" is protected by the state against subversive ideas and alien influences). Although it will be a long time before E-Russianization reaches the point of no return and Russia develops a pluralistic, if not necessarily a consensual, or civil, society, Kremlin hard-liners, for whom any social movements they cannot reliably "manage" are anathema, will be quick to warn that Russia is on a dangerous slippery slope and must act to strictly limit the information revolution before it is too late.

Such warnings will have wide resonance within both the Russian establishment and the Russian public at large. A great many Russians from all walks of life believe that their country is already far too tolerant of political and cultural diversity and too exposed to Western economic and cultural forces. Nonetheless, there will be considerable opposition to interpreting and implementing the Information Security Doctrine too aggressively. While protagonists of a truly open society are hard to find among Russia's top officials, there are many who understand that heavy-handed efforts to prevent access to and use of information technologies would jeopardize the economic benefits they are hoping to reap from the information revolution—and thus would threaten a key element of the regime's legitimacy. Similarly, many top officials understand that a vigilant campaign against "cyberdissidents" could undermine the Putin administration's image in the West.⁵⁹

Aided by the fact that the rise of serious "cyberdissidence" is at worst a remote threat, these officials may be able to keep the administration's "cyberpolice" in check. The Putin administration's decision in June 2001 to withdraw its support for a law prohibiting majority for-

eign ownership of all media other than national TV may be indicative in this regard. However, a number of other actions—the officially inspired closure or emasculation of politically independent TV channels, radio stations, and publications, as well as the previously mentioned prosecution of Russians who collaborate with Western researchers and the efforts of the government to reintroduce controls on international exchanges—point strongly in the other direction. Where the balance of opinion on the merits of the information revolution for Russia will eventually be struck remains to be seen. What is already clear is that the battle over where it should be struck has been joined and is likely to become more contentious as the stakes—political control and conformity versus economic growth and competitiveness—increase for both sides.

Even in the improbable event that this conflict ends in an early and clear-cut victory for the protagonists of E-Russia, it will take a long time and many victories on other fronts (for example, the creation of a competitively attractive investment environment, with all the associated legislative, judicial, regulatory, and fiscal changes this implies) before Russia becomes fully networked and electronically integrated with the West. If and when this occurs, Russia is bound to become more "Westernized" in a number of important respects. There is little doubt, for example, that Western-based multinational corporations will begin to play a more significant role in the Russian economy and that more Russian citizens will be exposed to Western political and cultural influences. Moreover, to an even greater extent than the many previous processes of Westernization that Russia has undergone, this IT-driven wave is likely to have far-reaching and long-lasting societal effects. Although there is no danger that Russia will lose its distinctive national features (*its spetsifika*) as many Russians fear, the evidence of its divergence from the mainstream of Western development—which has been so apparent to most foreigners and to Russians themselves throughout most of their history—will become less compelling.

⁵⁹Because of its rich detail, diversity of viewpoints, and real-time reporting, the Runet is facilitating the ability of observers in the West to scrutinize the actions of the government. Prominent reviewers include *Johnson's Russia List* (<http://www.cdi.org/russia/johnson/>) and *RFE/RL Newsline* (<http://www.rferl.org/newsline/>).

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